CHAPTER IV

DESIGN ANALYSIS

4.1 Site Analysis

4.1.1 Site Existing Conditions

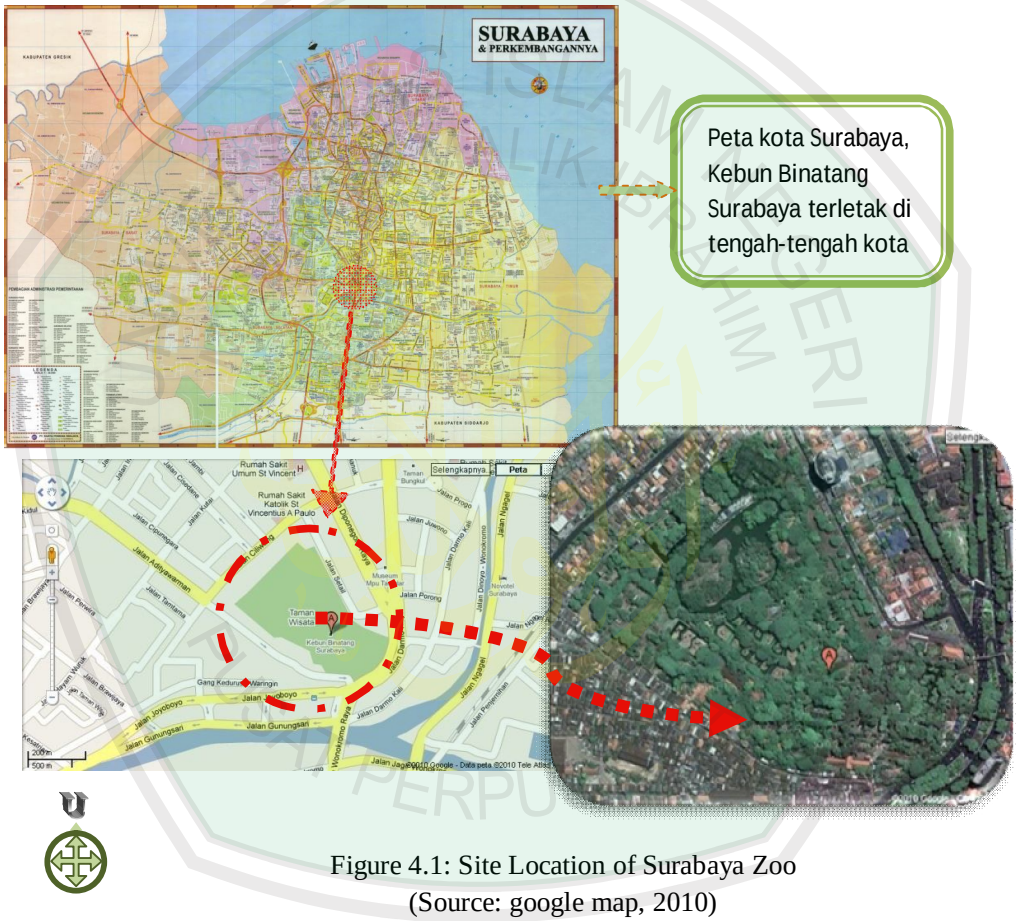


Figure 4.1: Site Location of Surabaya Zoo
(Source: google map, 2010)

Site Location : Surabaya Zoo region

Setail street no. 1, Surabaya

Site Existing : Build land Surabaya Zoo

Land Area : 150.000 m2

Some of the advantages from the location of the site are as follows:

1. Access is easy to reach from all directions, namely from southern cities such as Sidoarjo, Pasuruan, Malang and northern cities such as Lamongan, Gresik. Especially for the city of Surabaya itself is fairly easy to access as the main street of the city of Surabaya through the location of the site.
2. Ease of facilities and infrastructure in the form of public transportation such as buses, public transport, and railways.
3. Information network that is easy on the object as well as information about the conditions around the site, due to the location of the site, which was in the middle of town.

Some of the deficiencies from the site are as follows:

1. The times and the addition of factors make the collection of animals for land expansion, but the location of the site does not allow for the expansion, because the site has been built around public housing.

4.1.2 Boundaries and Dimensions of the Site

The following site boundaries Surabaya zoo:

- North : Settlement, office and Setail street, Surabaya
- East : Settlement, office and Darmo Raya street, Surabaya
- West : Settlement, Katolik St Vincentius A Paulo hospital and Ciliwung street, Surabaya
- South : Settlement and Joyoboyo street.

Figure 4.2 : Boundaries of Surabaya Zoo
(Source: Google map, 2010 dan hasil survei, 2010)

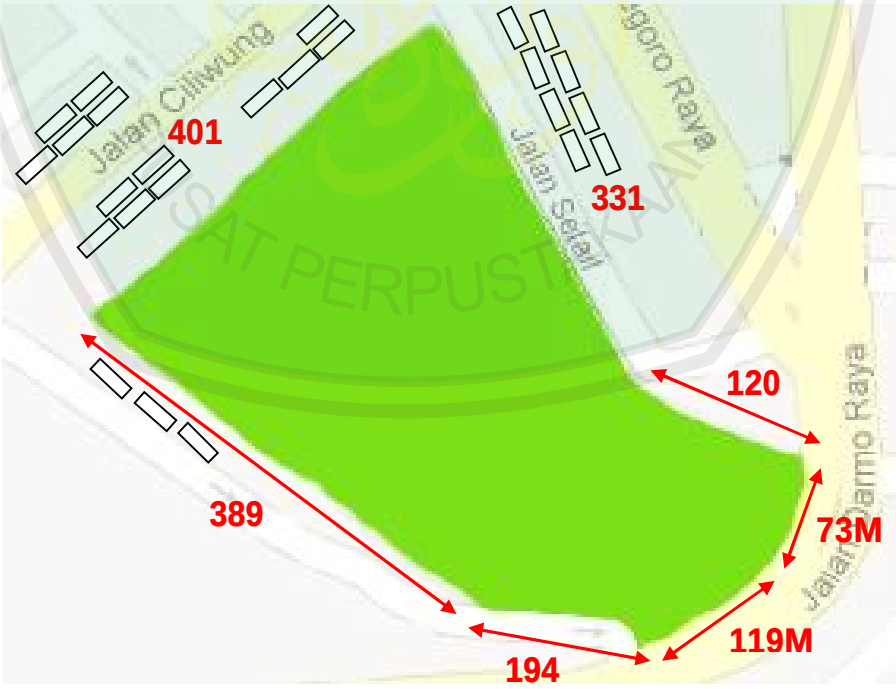


Figure 4.3: The size of the Surabaya Zoo
(Source: Hasil Survei, 2011)

4.1.3 Pathways Analysis of the Site

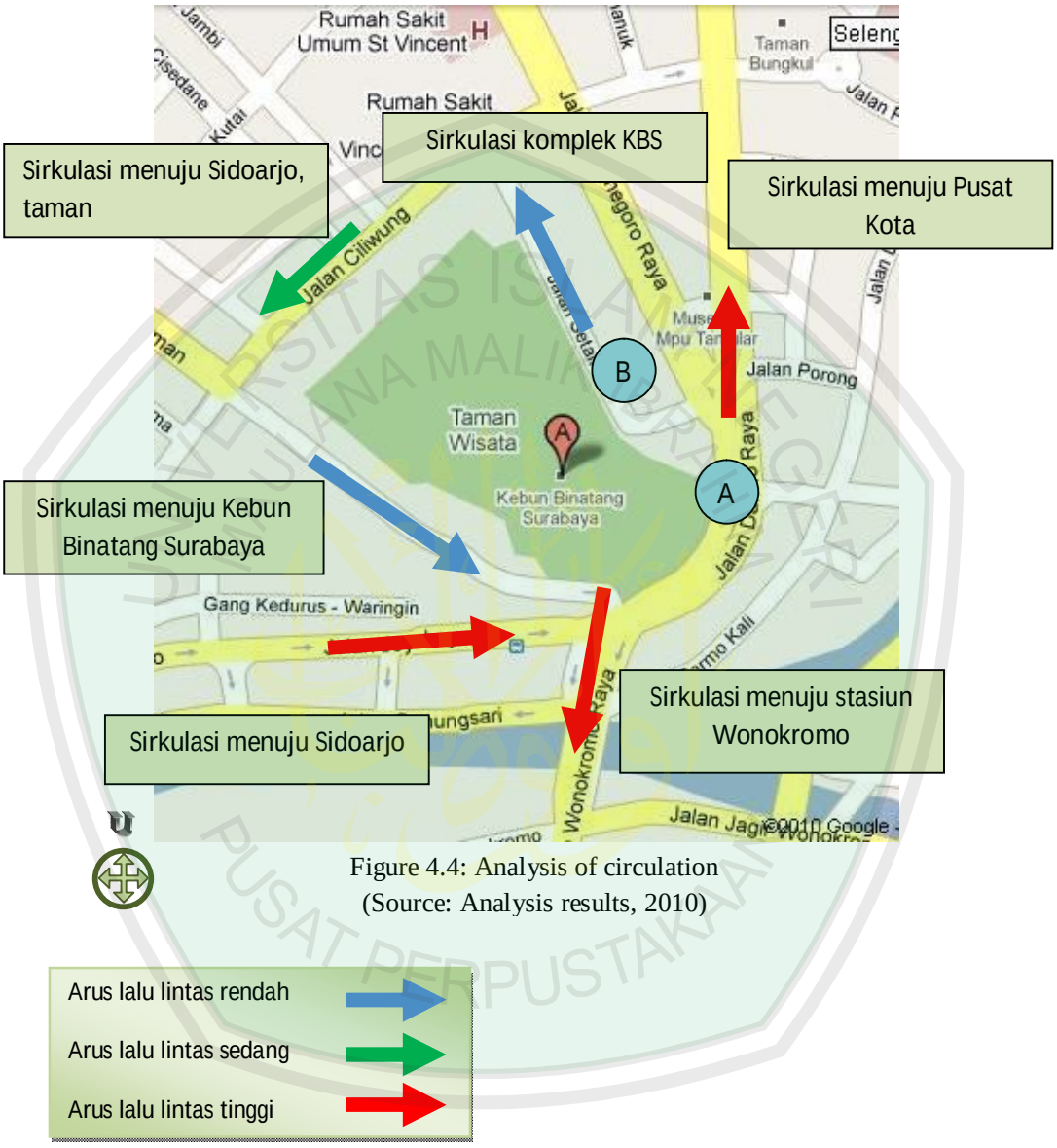


Figure 4.4: Analysis of circulation
(Source: Analysis results, 2010)

At point A, is a circulation path that has a high traffic flow. This is because the road is a road that connects the entrance Surabaya Zoo, and is also the main street of the city of Surabaya.

At point B, is low because it is a circulation path branching from the main road to the city of Surabaya.

4.1.3.1 Entrance Analysis

Initial conditions at Surabaya zoo, located at the front entrance directly opposite the road.

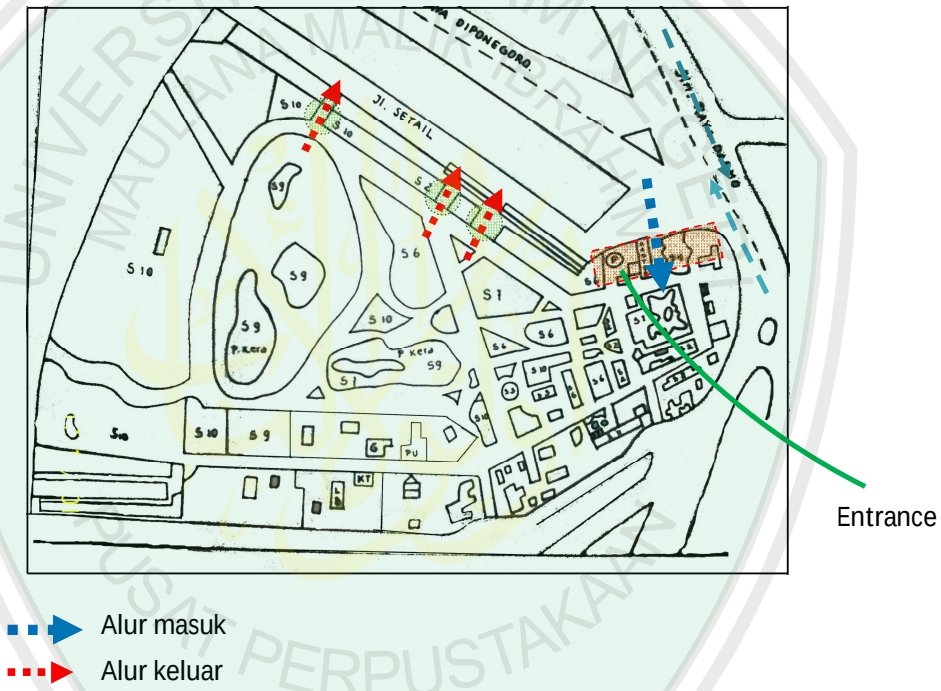


Figure 4.5: Entrance analysis on the initial conditions
(Source: Analysis results, 2010)

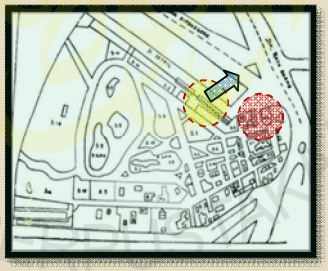
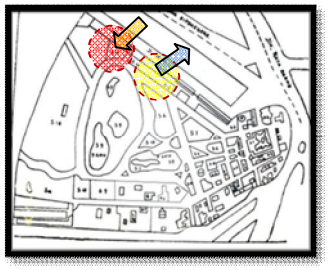
On the initial conditions the flow in and flow out distinguished, located at the entrance into the flow, while the grooves out on the other side leading to the parking lot. At the exit made several pathways directly related to parking.

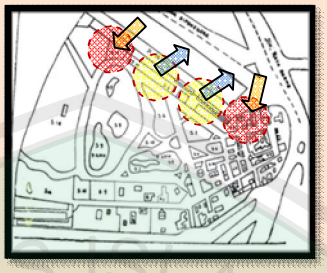
At the entrance is directly related to the administration building, which allows visitors to see this building. Entrance is located on the front that are directly related to Darmo Raya street easier for visitors to find out the main entrance. In this section there are also drop out for visitors who come by public transport.

Entrance to the zoo is only in this position only, centered. At the entrance there is no other.

From the analysis of the circulation above the entrance acquired a variety of alternatives are:

Table 4.1: Entrance analysis

No.	Jenis *Entrance*	Figure	Keterangan
1	*Entrance* diletakkan di bagian depan berhadapan langsung dengan jalan raya, entrance yang sudah ada sebelumnya. *Exit* diarahkan langsung ke parkir.		Arus terpusat, pencapaian yang mudah dan mudah ditandai pengunjung. Tetapi saat tingkat pengunjung tinggi akan terjadi kepadatan.
2	*Entrance* berada di posisi utara, berbatasan dengan jalan yang berarus kecil. *Exit* langsung diarahkan keparkir.		Arus terpusat, tetapi sudah ditandai pengunjung dengna posisi yang tidak terlihat, pada saat tingkat pengunjung tinggi akan terjadi

			kepadatan.
3	Penggabungan dari jenis *entrance* 1 dan 2, membuat dua entrance. *Exit* langsung diarahkan ke parkir.		Arus tidak terpusat, mudah ditandai. Tidak terjadi kepadatan pada tingkat pengunjung tinggi.

(Source: Analysis results, 2011)

Keterangan: Exit Entrance

4.1.3.2 Pathways Analysis of the Site

Factors that are influential in the successful design of the zoo one of which is the circulation of each user to visit the exhibition, it is important to consider because the circulation pattern of the right of each exhibition will be seen and passed by the visitors.

Figure 4.6: Circulation analysis on the initial conditions
(Source: Analysis results, 2010)

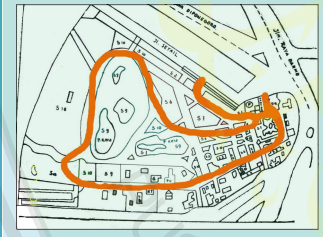
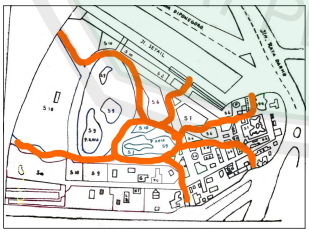
Sirkulasi awal pada tapak

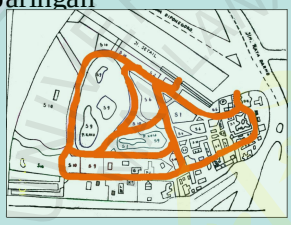
Circulation in the initial conditions Surabaya zoo has grooves that are interconnected. Not have a pattern that directs visitors to pass through the entire exhibit. So that the flow of visitors interconnected difficult to find the right groove, the whole exhibit is also difficult to go through everything because circulation is confusing.

But with such circulation is a short path and the intersection is going to allow visitors to an object or exhibit.

The analyzes performed were:

Table 4.2: Analysis of circulation on the site

No.	Jenis	kelebihan	kekurangan
1	Linier 	Pola linier baik, mengarahkan dengan satu arah, pameran terlihat semua	Kesan monoton, alur terasa panjang
2	Radial 	Mengarahkan kesegalah arah dengan satu titik pusat.	Pameran tidak terlewati secara berurutan
3	Spiral 	Memberi kesan berpetualang dengan bentuk melingkar, tidak monoton	Telalu banyak lingkaran berkesan memusingkan, pandangan tidak luas, alur semakin

			panjang.
4	Grid 	Bentuk lebih teratur	Pameran tidak terlewati secara berurutan dengan kondisi sirkulasi yang terpisah-pisah
5	Jaringan 	Setiap pameran terhubung, mendapat alur yang cepat untuk menuju pameran lainnya	Pameran tidak terlewati secara berurutan, tidak mengetahui jalan utama pameran
6	Komposit 	Bentuk bervariasi, tidak monoton, banyak alternatif yang dipilih pengunjung untuk menjalani pameran, mendapat suasana yang berbeda	Alur akan semakin panjang

(Source: Analysis results, 2011)

Keterangan:

Sirkulasi

4.1.4 Analisis Orientasi

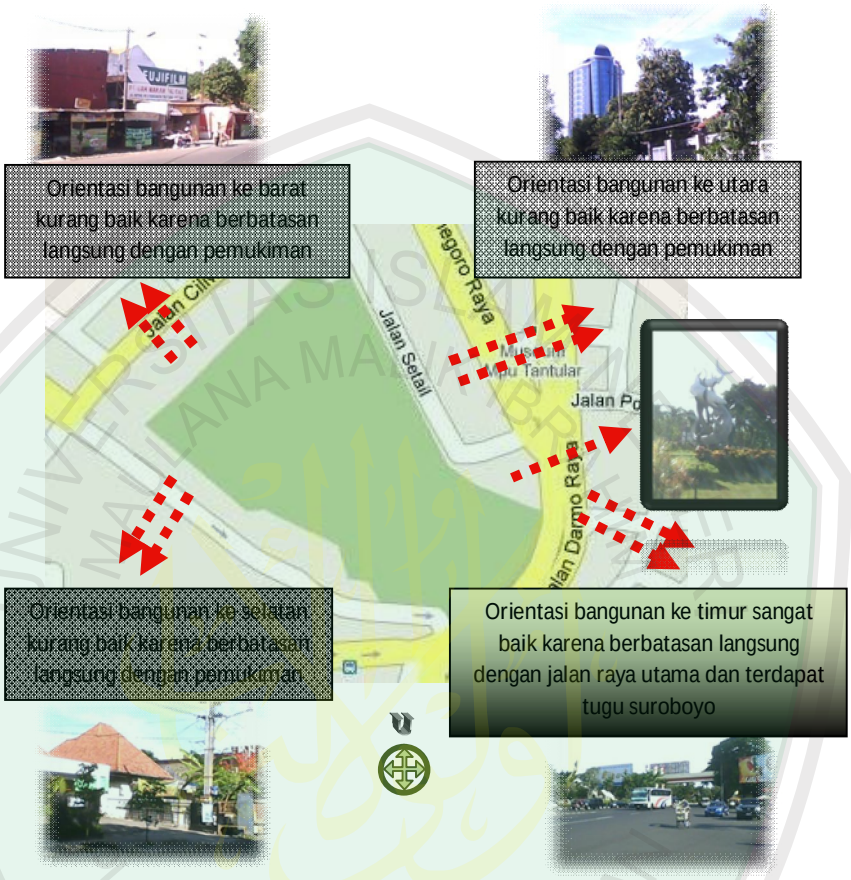


Figure 4.7: Analysis of the orientation
(Source: Analysis results, 2010)

In the analysis of more direct orientation to the direction and location of the building that would later lead to the entrance to the site.

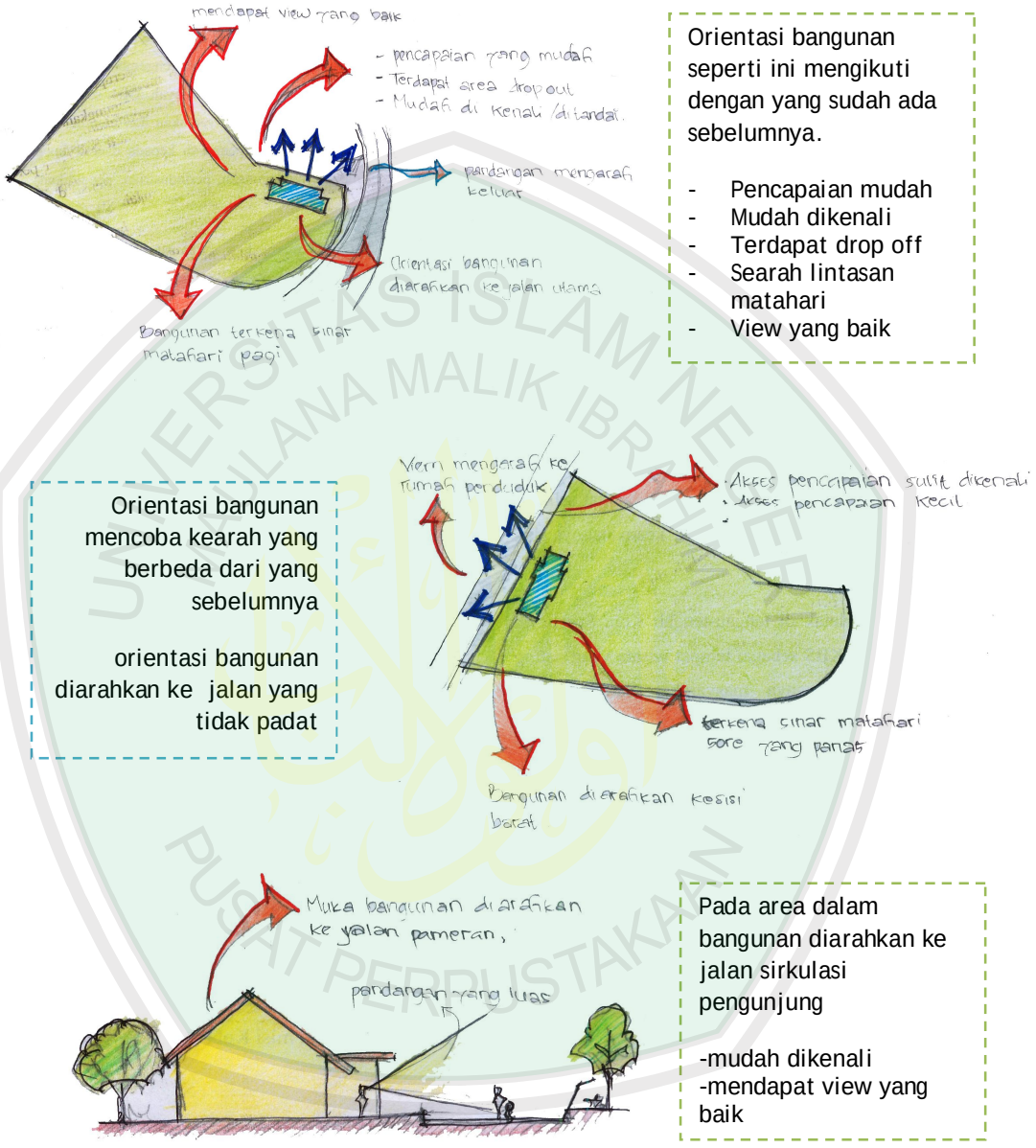


Figure 4.8: Alternative analysis of orientation
(Source: Analysis results, 2011)

4.1.5 Views Analysis

4.1.5.1 View to the Outside

Figure 4.9: View to outside analysis
(Source: Analysis results, 2010)

In the view out the analysis is intended to get a good view outward. Based on the function, all activities within the site. Optimized so that more is how to make the view at the site could be more interesting.

With creating a good view, but also attract visitors can add to the aesthetics in it.

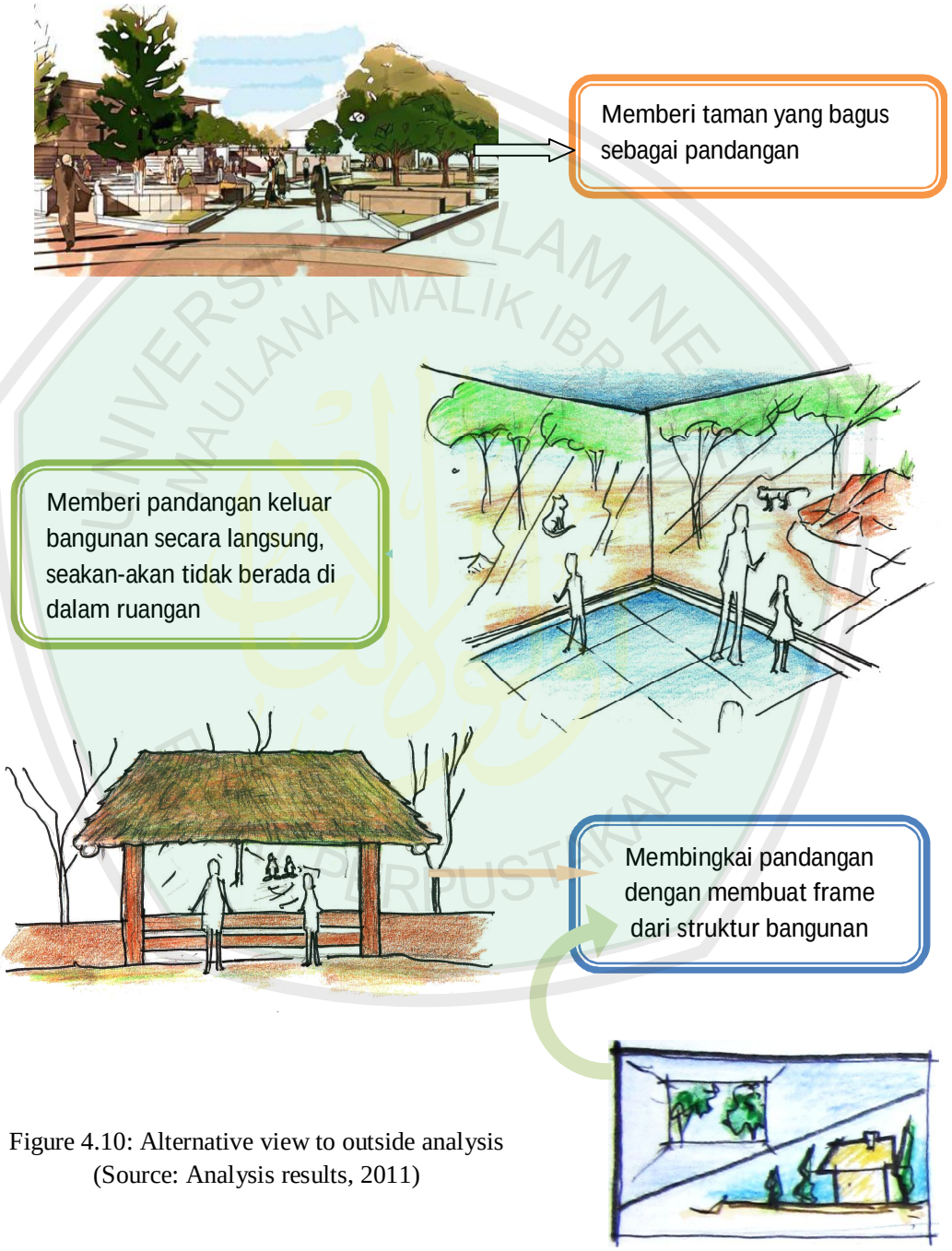


Figure 4.10: Alternative view to outside analysis
(Source: Analysis results, 2011)

4.1.5.2 View to the Inside

Figure 4.11: Analytical view into the site
(Source: Analysis results, 2010)

View into the site is more optimized, because in this area do not support the environment for a better view, by placing trees in area as a view from outside

View into the tread is good, because in this area will be used as the main entrance, so it needs to process an attractive facade on this area

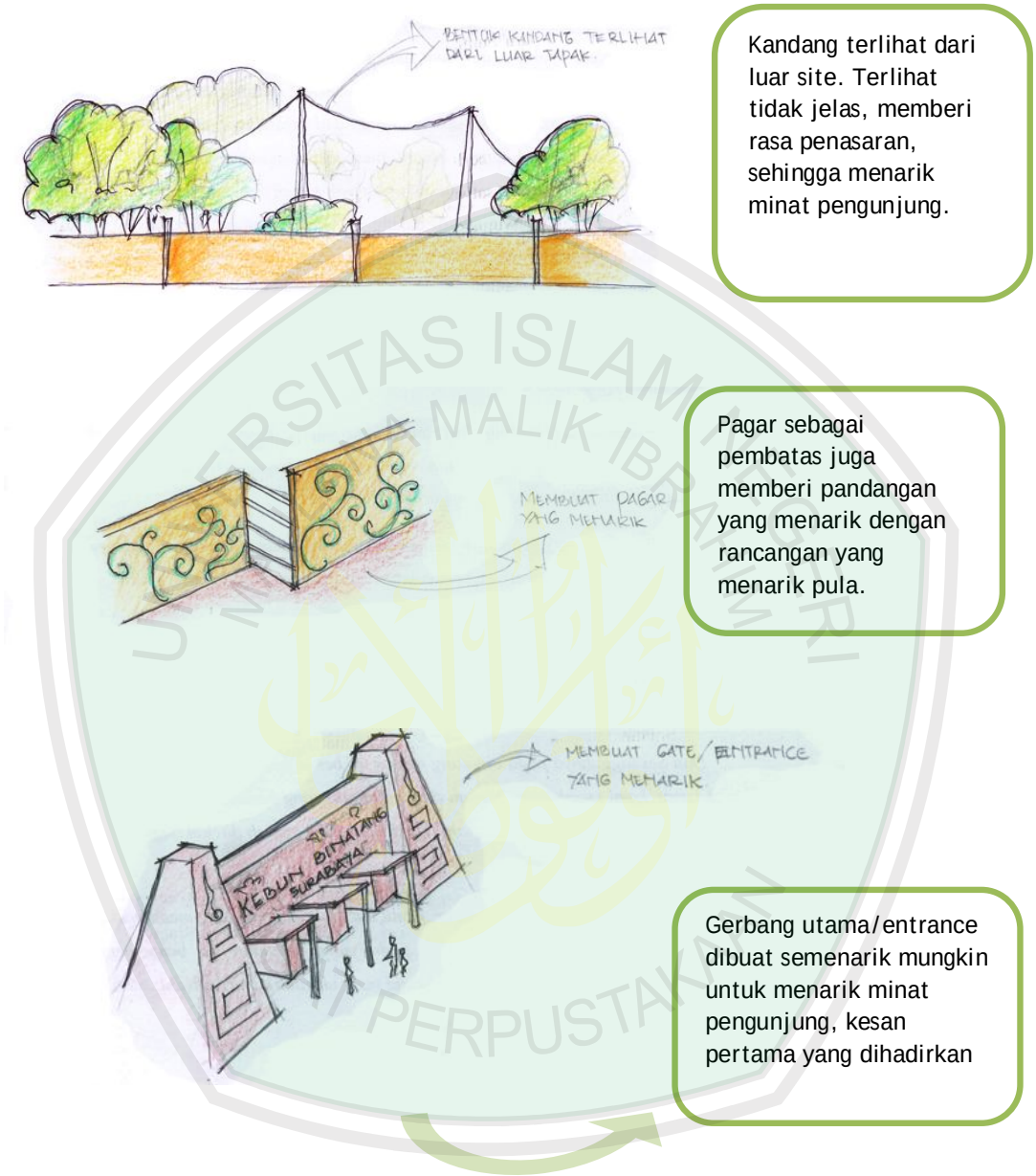


Figure 4.12: Alternative view into the side analysis
(Source: Analysis results, 2011)

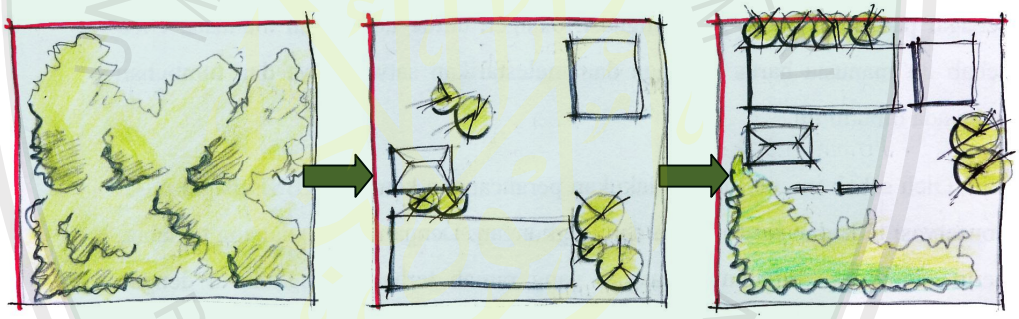
4.1.6 Plants Analysis

Figure 4.13: Analysis of vegetation on the site
(Source: Analysis results. 2010)

At some sites there is no vegetation, only in the western part of your included vegetation, and its existence as well as the greening of the highway. While on the site there are many trees whose existence as a replacement for the original habitat of animals that are on it. Existing vegetation can be recycled into better, this is a potential for the site.

The vegetation found on site as follows:

Figure 4.14: The types of vegetation on the site
(Source: Analysis results, 2010)



Set the untreated vegetation and then combine it with other elements, thus becoming a new and better. At the Surabaya Zoo is the amount of vegetation and there are many parts that are not processed which will then be utilized and processed into a better than ever. In the redesign, the presence of vegetation as a reference for determining the location determinants of animal cages. Little vegetation on the conditions that will be placed cages of animals that require a high sun, while there are many areas of vegetation will be placed cages, tropical animals in the forest habitat.

Vegetation types used in accordance with the functions of the vegetation. Some of these vegetation types include directional tree, shrub tree / grass and shade trees. At the Surabaya Zoo existing vegetation will be maintained and arrange the parts that are not maintained.

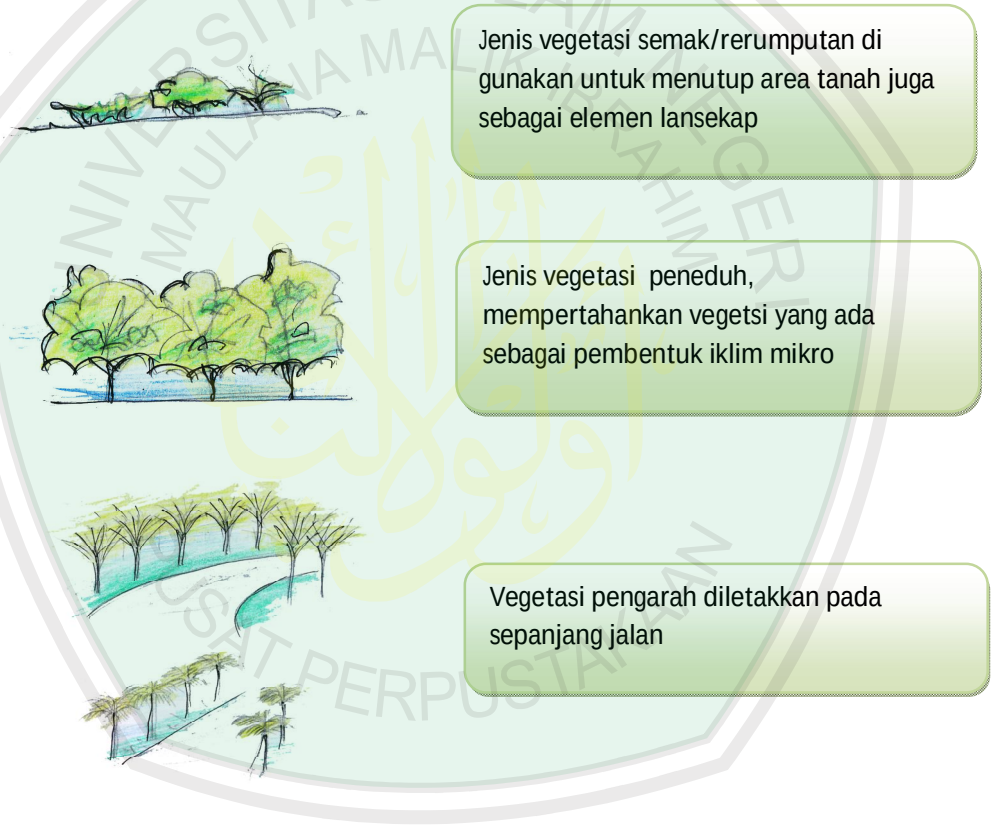


Figure 4.15: Vegetation types to be used
(Source: Analysis results, 2011)

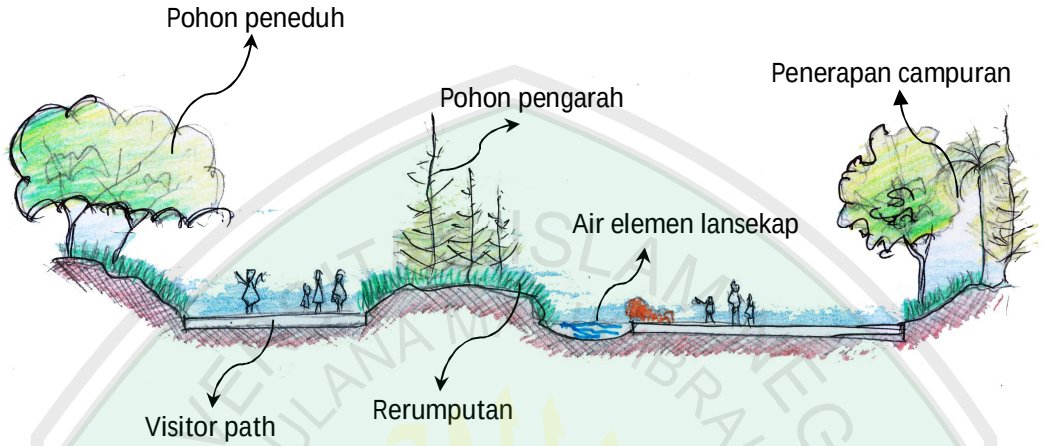


Figure 4.16: Alternative analysis of vegetation on the site
(Source: Analysis results, 2011)

4.1.7 Noise Analysis

Noise is one of the main obstacles that must be resolved, because the presence of noise can interfere with the activities in the areas that need quiet, so there should be a controller for such noise. At the Surabaya zoo there are areas that require no noise and there are areas that do not affect the noise.

At high noise areas are areas that need peace like the office of trustees, clinic, and other buildings, while in the middle of a quiet area of the site or exhibit area or animal cages.

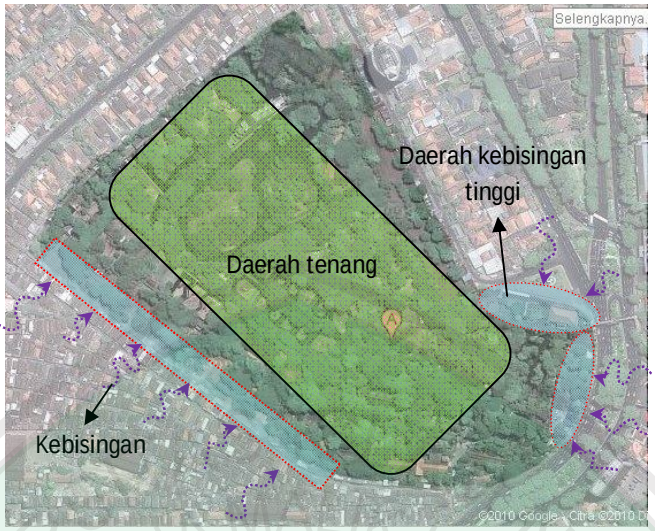


Figure 4.17: Noise analysis on the condition of existing
(Source: google map, 2010)

To solving the noise, there are several alternatives, as follows:

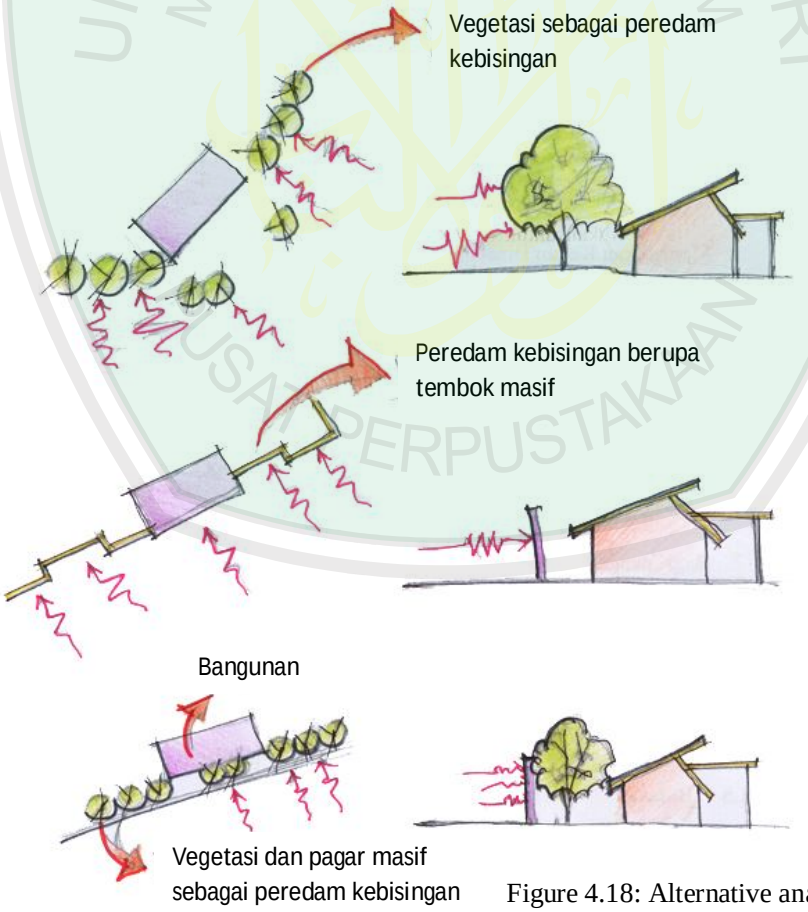


Figure 4.18: Alternative analysis of noise
(Source: Analysis results, 2011)

4.1.8 Climate Analysis

4.1.8.1 Sunlight Analysis

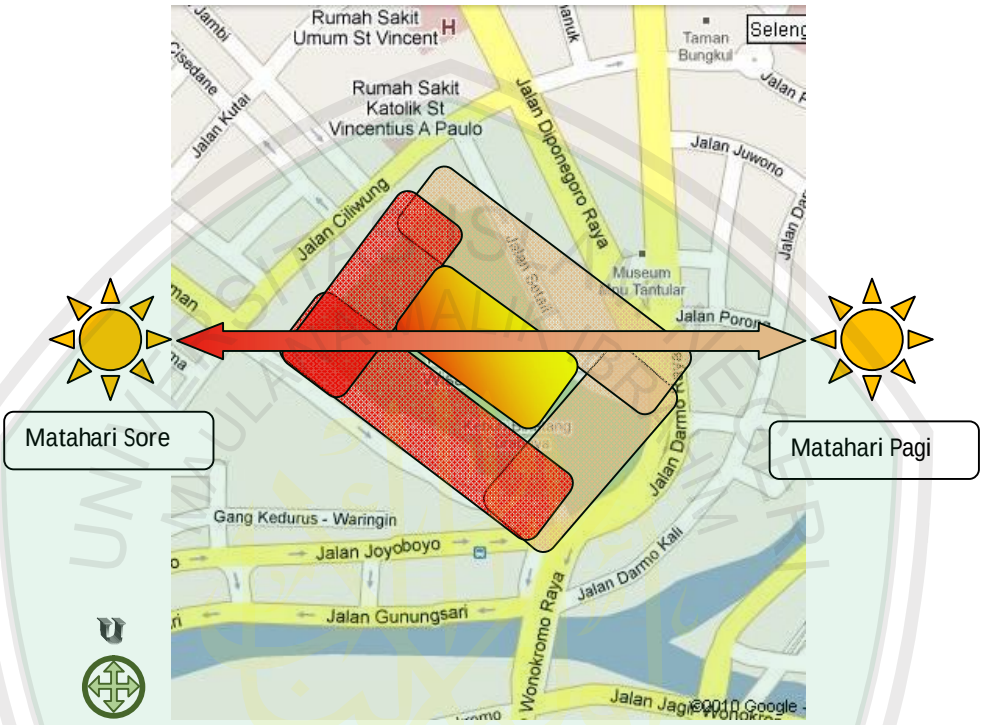
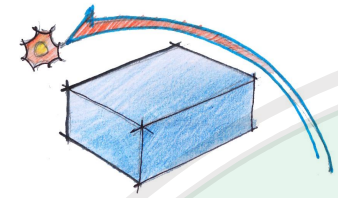


Figure 4.19: Analysis of the sun
(Source: google map, 2010, Analysis results, 2010)

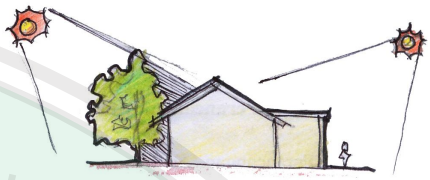
Areas exposed to sunlight in the morning, the area is maximized openings for morning sunlight into the room to its full potential. In this area also be maximized for public facilities for visitors so that comfort can be felt.

Areas affected by the afternoon sun, in this area-not avoid the use of a wide aperture, or also use a barrier or shading to avoid the blinding afternoon sunlight and heat. In this area can be used for animals that require a high sun and placement of vegetation along the circulation for visitors

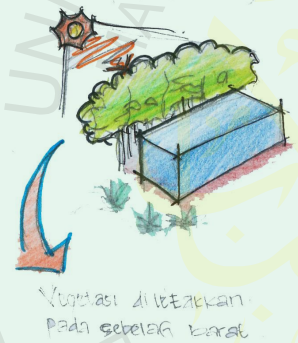
Areas affected by the afternoon sun is not too hot. Neutral area that can be enabled for visitor activities.



Orientasi bangunan diarahkan ke sinar matahari pagi

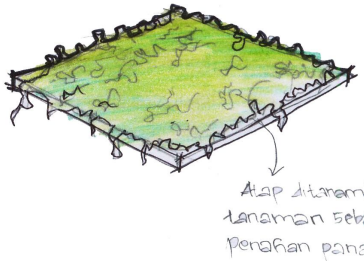


Sinar matahari pagi pada bagian timur membawa sinar yang baik dan pada sore hari sinar matahari menjadi panas

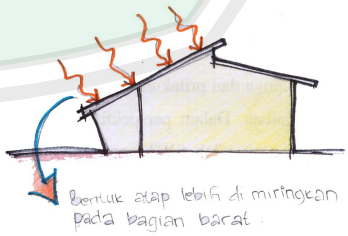


Vegetasi diletakkan pada bagian barat sebagai filter dari sinar matahari yang panas

Memberi bukaan yang lebar untuk memasukkan sinar matahari pagi yang baik untuk kesehatan



Roof garden mengurangi panas yang diterima bangunan



Kemiringan atap lebih di pertajam pada bagian barat

Figure 4.20: Alternative analysis of the Sunlight
(Source: Analysis results, 2011)

4.1.8. Wind Analysis

The analysis was conducted to the wind to get the best design in the utilization of wind. On the condition of site existing of the wind blowing east to west. On the opposite side of the highway directly with eastern winds will experience much faster and cleaner greater than on the inside. While on the inside of the air filter has experienced quite a lot of vegetation on the site, so that in the cage was no need for special measures for the wind.

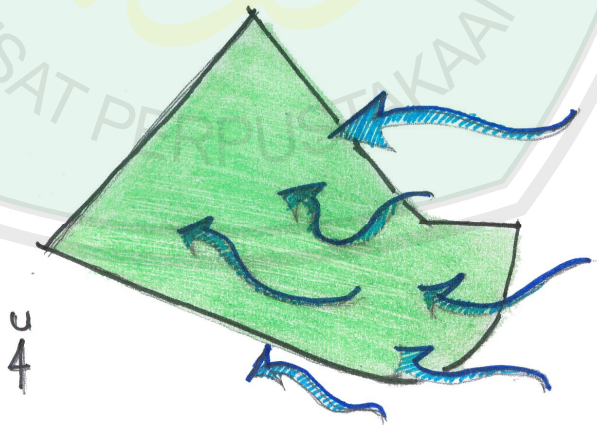
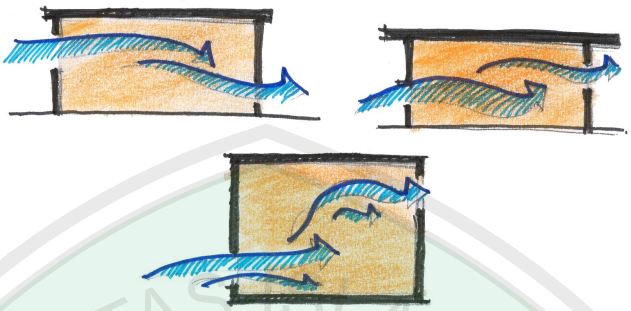


Figure 4.21: Wind flow at the site
(Source: Analysis results, 2011)

As for the alternatives of wind analysis as follows:



Membuat *cross ventilation* pada bangunan dengan bentuk-bentuk cara pembuatannya

Memberi tanaman sebagai pengarah angin ke bangunan dan juga sebagai filter dari kencangnya angin dan debu

Mengarahkan angin dengan bentukan struktur bangunan dan juga penambahan vegetasi sebagai pengarah dan penyaring angin

Menetukan orientasi bangunan untuk mengalirkan angin dan menanam vegetasi sebagai filter angin

Figure 4.22: Alternative analysis of wind
(Source: Analysis results, 2011)

4.1.8.3 Analysis of Temperature and Humidity

The higher the temperature the higher the ability of air to absorb water. Temperatures in the city of Surabaya is quite high, especially during the dry season. This makes the higher the air to absorb water. Therefore, the city of Surabaya to humid heat. With state of the temperature and humidity as it may determine appropriate areas with animals in it. As in areas of high temperature will put the cages of animals that require high temperatures such as camels and savannah animals (zebras, horses, lions, etc.).

As an alternative to improve comfort:

- Equipment in the building that produces direct cooling by evaporation.
- Installation on the outside and around the building that can assist in cooling the room. Cooling occurs by a decrease in wall temperature, air conditioning or roof of the building touches.
- Placement of the cage according to the type of animals that require high temperatures or low.

Application of the design:

- Vegetation in the area around the exploited and do not close the air flow
- The area around the building given the flow of water such as ponds, artificial river but the water must flow around the site.
- In the cages were given some vegetation as a shade, as well as some cages without vegetation adapted to the wildlife therein.

While the treatment cages to temperature and humidity adjusted to correspond with the animals natural habitat. The analysis can be performed as follows:

- Veterinary Tropical placed on areas with more vegetation because the humidity will be higher and the sun just coming from the crevices of the tree. In the cage can be added to the water / pool as.
- Animals will be placed on the savannah areas with less vegetation so that the sun can be entered directly into the enclosure so that the lower humidity and higher temperatures. Reduce or without the addition of water / swimming a lot.

4.1.9 Zoning Analysis

Zoning analysis done in order to place or classify areas according to function.

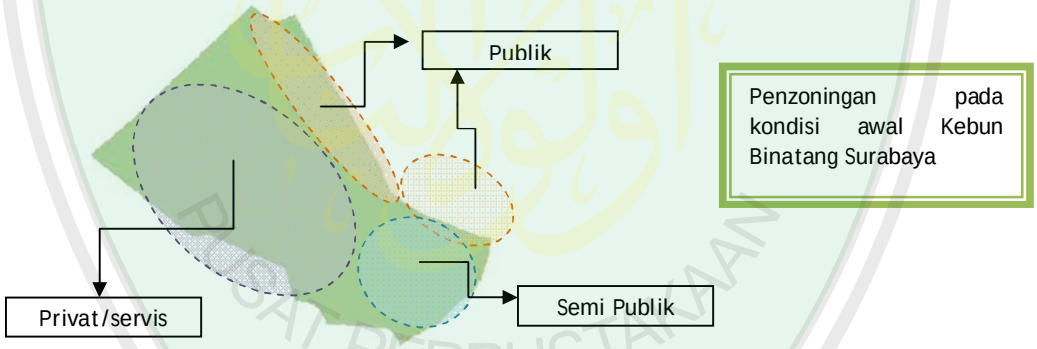


Figure 4.23: Zoning Analysis of existing conditions
(Source: Analysis results, 2010)

- Public : Parking, ticketing
- Semi public : Office manager, general office
- Private/service: animal cages, clinic, library, aquarium, cafe and souvenir shop, room service

In the beginning of zoning seen in the north there are parking spaces such as cars and motorcycles, ticketing at the main entrance is called the public area.

Then, after entering into the offices will be found in the form of office management and general office, these offices into the semi-public zone. While at the cages of the animals there, and other such facilities, veterinary clinics, aquarium, cafe / restaurant and shop souvenir, and service spaces.

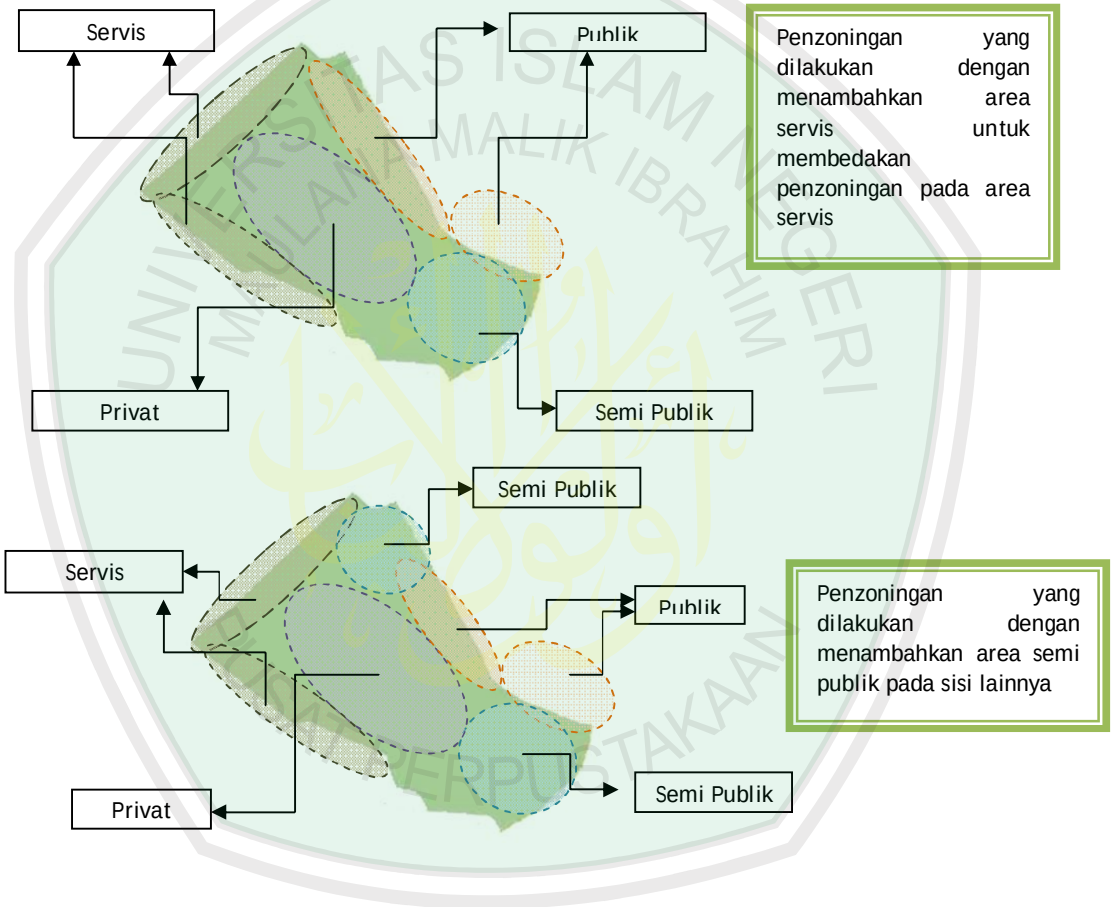


Figure 4.24: Zoning Analysis
(Source: Analysis results, 2010)

4.2 Analysis of the Function

As mentioned in previous chapters that the function of the zoo where animals are kept as in an artificial environment and exhibited to the public. Besides the zoo also serve as recreation, education, research, and places for conservation of endangered wildlife. So is the Surabaya Zoo, the zoo also serves as mentioned above.

From the description of the functions of the zoo over, Surabaya Zoo functions can be distinguished based on their importance. The function can be described as follows:

1. Primary function, this function is the main function of the building. The activities of the primary function is as a container for animals that are kept in an artificial environment, as the conservation of endangered animal species, as a place of education, research, education.
2. Secondary function, this function is a function that is used to support the main activity, while the function is as a place of recreation, as the garden city of Surabaya in environmental conservation efforts.
3. Support functions, as for the support function is as a walking area, a place of exercise.

4.3 Programmatic Analysis of Space

4.3.1 Analysis of User

Surabaya Zoo is building educational, social, and conservation of the course in the implementation of activities contained therein user. Users in this zoo

object includes managers and visitors. Furthermore some user activity will be described as follows:

4.3.2 Analysis of the Flow of Activities

4.3.2.1 Analysis of Management Activities

Manager is a person or group of persons who are included in the service organization and maintenance of zoo visitors. Management activity is the activity of structurally related institutions directly or indirectly with the building and visitors. The proficiency level management activities are:

a. Daily Management Activity

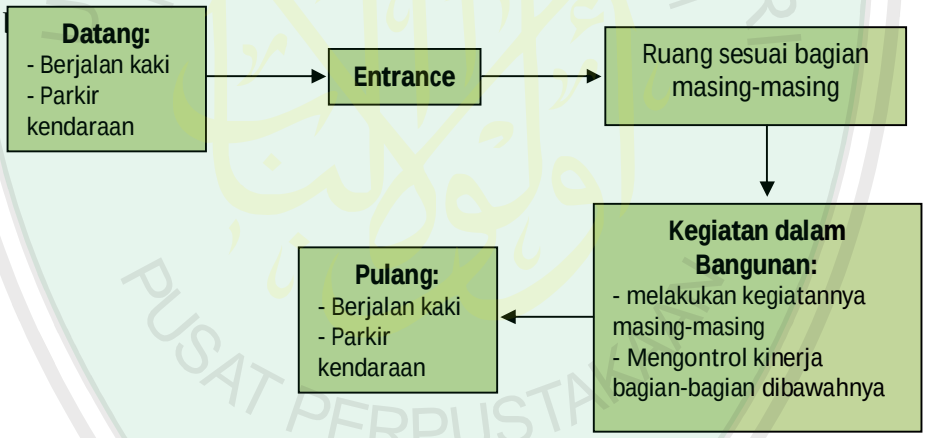


Figure 4.25: Daily activities of the management scheme
(Source: Analysis results, 2010)

c. Staff / Experts Activity

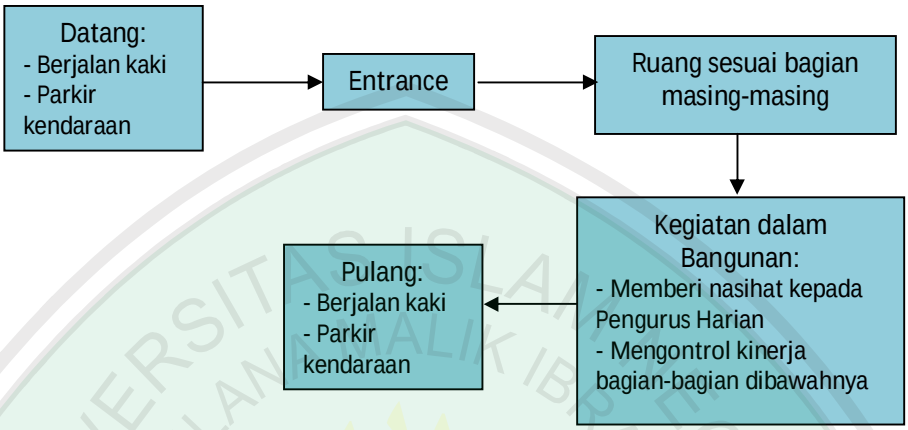


Figure 4.26: Staff / experts activity scheme
(Source: Analysis results, 2010)

d. Staff Executing Activity

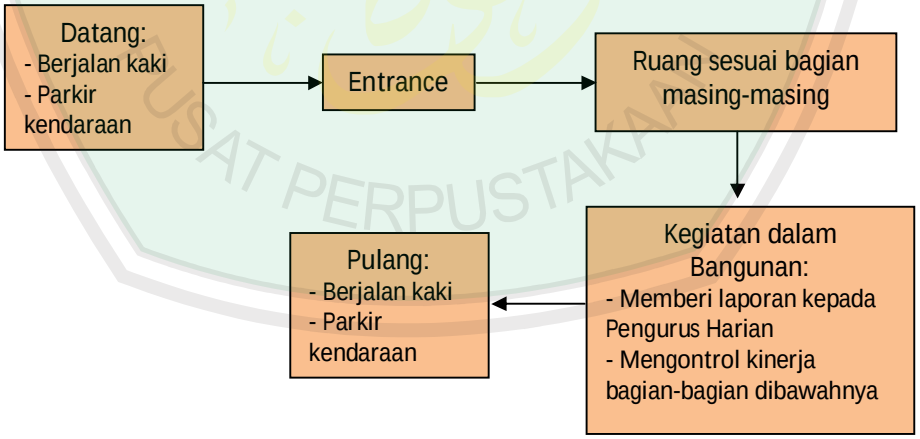


Figure 4.27: Staff executing activity scheme
(Source: Analysis results, 2010)

e. Public Relations Education Activities

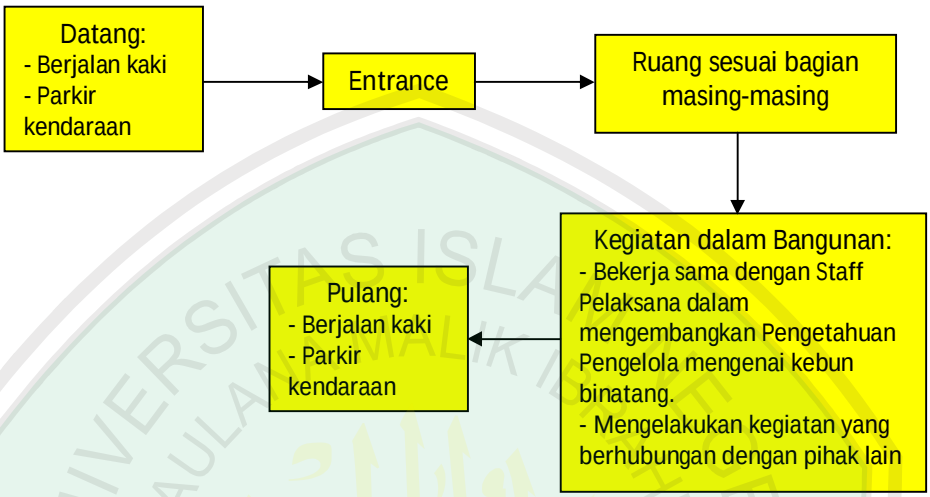


Figure 4.28: Scheme of public relations education activities
(Source: Analysis results, 2010)

f. Administration Activities

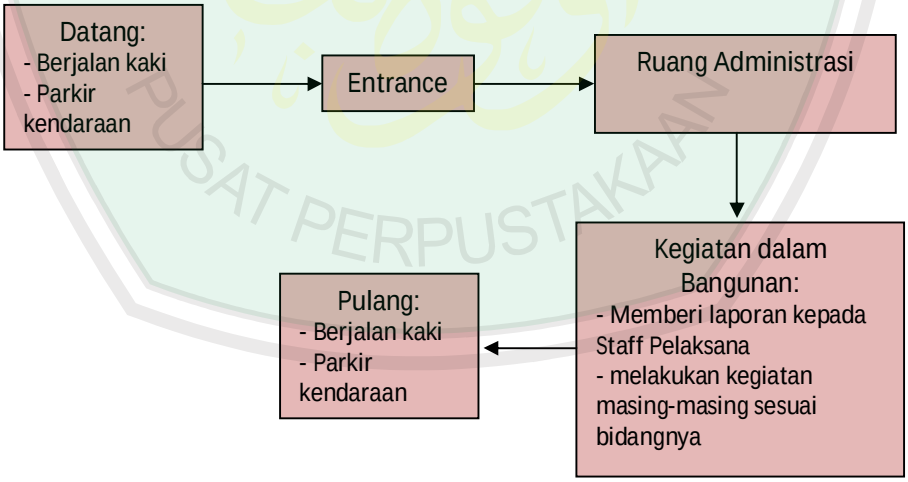


Figure 4.29: Scheme administration activities
(Source: Analysis results, 2010)

g. Activity of the Animal Health

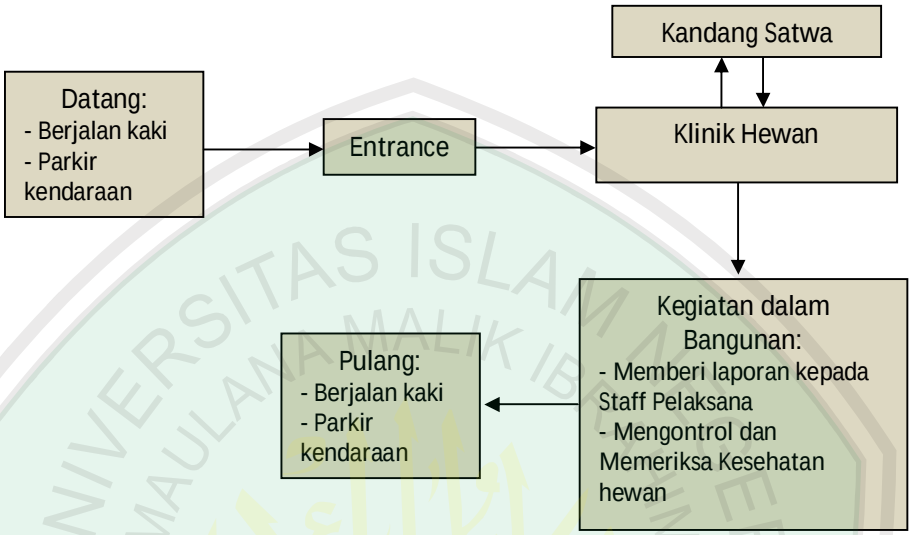


Figure 4.30: Activity of the animal health scheme
(Source: Analysis results, 2010)

h. The maintenance of Wildlife Activity

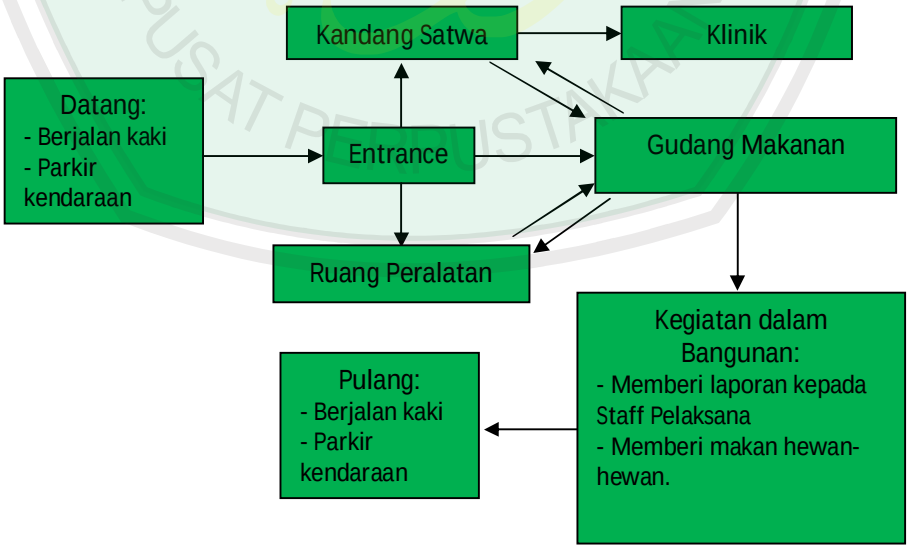


Figure 4.31: The maintenance of wildlife activity scheme
(Source: Analysis results, 2010)

i. building and garden maintenance Activity

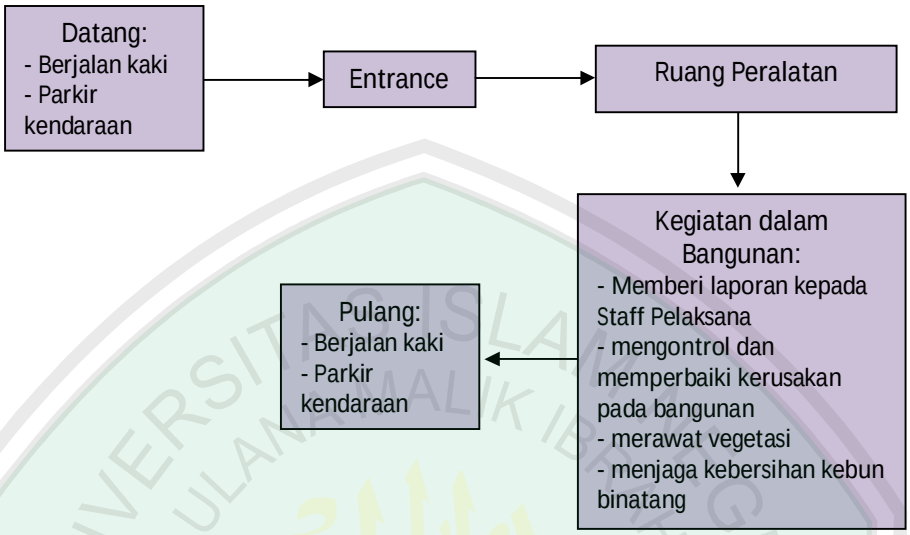


Figure 4.32: Scheme of the activity of building and garden maintenance
(Source: Analysis results, 2010)

4.3.2.2 Visitor Activity Analysis

The visitor is a person or group of people who come to visit a place, in this zoo is a place for visitors to visit. The flow of visitor activity as follows:

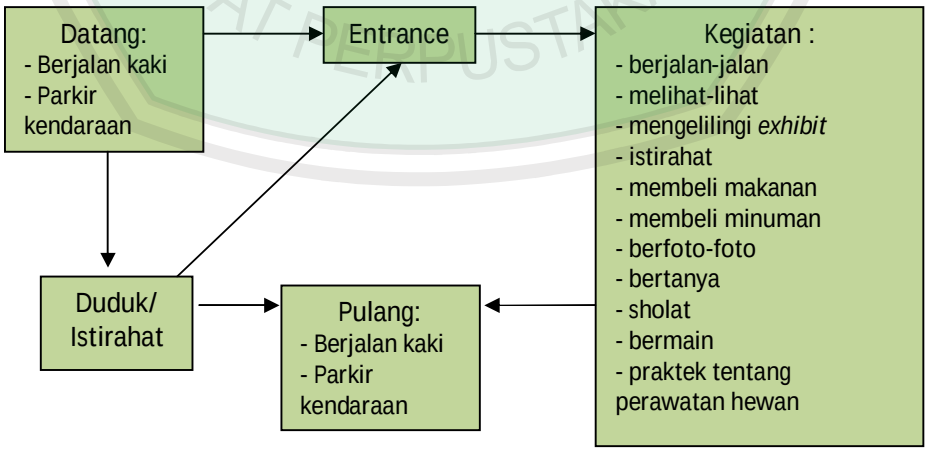


Figure 4.33: Scheme of visitors activity
(Source: Analysis results, 2010)

4.3.3 Space Needs Analysis

Table 4.3: Space Needs Analysis

FUNGSI	FASILITAS	PENGGUNA	KEGIATAN	KEBUTUHAN RUANG
Hall Penerima	Ticketing Area	Pengunjung	Membeli ticket Menanyakan informasi	Ticketing area Information area
		Karyawan	Menjual ticket Memberi informasi	
	Penerima Tamu	Pengunjung	Duduk-duduk Bersantai Bercengkrama Menanyakan informasi kawasan tersebut	Hall Tourism information centre Security post
		Karyawan	Memberi informasi Menjaga keamanan	
Fasilitas Utama	Kandang Mammalia	Pengunjung	Memilihat Membaca tanda/nama hewan Berfoto Bertanya	Ruang service Ruang penyimpanan makanan Kandang luar Kandang dalam Ruang karantina
		Karyawan	Memberi makan satwa	

			Membersihkan kandang Merawat satwa Memberi informasi	
	Kandang Aves	Pengunjung	Memilihat Membaca tanda/nama hewan Berfoto Bertanya	Ruang service Ruang penyimpanan makanan Kandang luar Ruang karantina
		Karyawan	Memberi makan satwa Membersihkan kandang Merawat satwa Memberi informasi	
	Kandang Reptile	Pengunjung	Memilihat Membaca tanda/nama hewan Berfoto Bertanya	Ruang service Ruang penyimpanan makanan Kandang luar Kandang dalam Ruang karantina
		Karyawan	Memberi makan satwa Membersihkan kandang Merawat satwa Memberi informasi	

	Aquarium pisces	Pengunjung	Memilihat Membaca tanda/nama hewan Berfoto Bertanya	Ruang service Ruang penyimpanan makanan Kolam Aquarium
		Karyawan	Memberi makan satwa Membersihkan kandang Merawat satwa Memberi informasi	
Fasilitas Pendukung	Café/restoran	Pengunjung	Memesan Makan dan minum Bercengkrama Buang air	Area makan Bar R. Persiapan Dapur Pantry Washing area Storage Toilet
		Karyawan	Memassak makanan Mempersiapkan makanan Membuat minuman Mencuci piring Menyiapkan bahan masakan dan minuman Melayani pengunjung	

	Perpustakaan	Pengunjung	Membaca buku Duduk-duduk Menanyakan informasi	Lobby Ruang baca Ruang koleksi Toilet
		Karyawan	Menjaga kebersihan Merawat buku dan peralatan Memberikan informasi Buang air	
	Clinik Hewan	Pengunjung	Menanyakan informasi	Lobby Ruang perawatan Ruang obat Laboratorium Pantry
		Karyawan	Merawat kesehatan hewan Menjaga kebersihan Memeriksa penyakit hewan Mencuci tanyan dan alat praktek Menyimpan obat	
	Diorama	Pengunjung	Melihat-lihat pameran Berdiskusi Menanyakan informasi	Lobby Ruang pameran storage

		Karyawan	Menjaga pameran Menjaga kebersihan Memberi informasi	
	Masjid/mush olla	Pengunjung	Berwudhu Sholat Berdoa Istirahat Buang air	Tempat wudhu Ruang sholat Teras Toilet Gudang peralatan
		Karyawan	Berwudhu Sholat Berdoa Menjaga kebersihan Buang air	
	Souvenir shop	Pengunjung	Member barang Melihat-lihat	Kasir Ruang display
		Karyawan	Menjaga kebersihan Merawat barang Menjual barang	
	Coffee shop	Pengunjung	Makan Minum Bercengkrama	Area makan R.Persiapan Dapur Pantry Washing Area Storage
		Karyawan	Memasak makanan Membuat minuman Mempersiapkan	

	ATM centre	Pengunjung	Mengambil uang	Ruang ATM
		Karyawan	Menjaga kebersihan	
Fasilitas Pengelola	Kantor pengelola	Pengunjung	Menunggu Berinteraksi dengan pengelola	Lobby Ruang tunggu R. Kepala pengelola
		Karyawan	Menerima tamu Meninjau kegiatan kebun binatang Mengatur kesekretariatan Mengatur fasilitas pendidikan Mengatur persediaan makanan hewan	R. Sekretaris R. rapat R. Kabag pendidikan R. Pemeliharaan satwa R. staff Toilet
Fasilitas Service	R. utilitas	Pengunjung	Memakirkan kendaraan Menunggu Melakukan interaksi dengan karyawan	Parkir Ruang keamanan Gudang R. istirahat karyawan Ruang ME Ruang plumbing Ruang P3K R. Karantina Toilet
		Karyawan	Mengawasi keamanan Menjaga kebersihan Mengawasi mechanical dan elektrikal	

			Melakukan kegiatan sanitasi Mendapatkan perawatan medis Mengkarantina hewan	

(Source: Analysis results, 2010)

4.3.4 Analysis of Space Requirements

Analysis space requirements at Surabaya zoo based on a review of theory and comparative studies have been conducted. The purpose of this analysis is to find comfort in accordance with the space needed to be analyzed. The space requirements to be analyzed is about whether or not natural light and artificial lighting, the natural and artificial, view, acoustic. By knowing the requirements of the spaces that have been known to above will facilitate the design.

Table 4.4: Space Requirements Analysis

RUANG	**PENCAHAYAAN**		**PENGHAWAAN**		**VIEW**	**AKUSTIK**	**SIFAT RUANG**
	ALAMI	BUATAN	ALAMI	BUATAN			
HALL PENERIMA							
Ticketing area							
Ticketing area							Terbuka
Information area							Terbuka

Penerima Tamu							
Hall							Terbuka
Tourism information centre							Terbuka
Security post							Tertutup
FASILITAS UTAMA							
Kandang Mammalia							
Ruang service							Tertutup
Ruang penyimpanan makanan							Tertutup
Kandang luar							Terbuka
Kandang dalam							Terbuka
Kandang karantin							Tertutup
Kandang Aves							
Ruang service							Tertutup
Ruang penyimpanan makanan							Tertutup
Kandang luar							Terbuka
Ruang karantina							Tertutup
Kandang Reptile							
Ruang service							Tertutup
Ruang penyimpanan							Tertutup

makana							
Kandang luar							Terbuka
Kandang dalam							Terbuka
Ruang karantina							Tertutup
Aquarium pisces							
Ruang service							Tertutup
Ruang penyimpanan makanan							Tertutup
Kolam							Terbuka
Aquarium							Terbuka
FASILITAS PENDUKUNG							
Café/restoran							
Area makan							Terbuka
Bar							Terbuka
R. Persiapan							Terbuka
Dapur							Tertutup
Pantry							Terbuka
Storage							Tertutup
Washing area							Terbuka
Toilet							Tertutup
Perpustakaan							
Lobby							Terbuka

Ruang baca							Terbuka
Ruang koleksi							Terbuka
Toilet							Tertutup
Clinik Hewan							
Lobby							Terbuka
Ruang perawatan							Tertutup
Ruang obat							Tertutup
Laboratorium							Tertutup
Pantry							Terbuka
Diorama							
Lobby							Terbuka
Ruang pameran							Terbuka
storage							Tertutup
Masjid/musholla							
Tempat wudhu							Terbuka
Ruang sholat							Tertutup
Teras							Terbuka
Toilet							Tertutup
Gudang peralatan							Tertutup
Souvenir shop							
Kasir							Terbuka
Ruang display							Terbuka

Coffee shop							
Area makan							Terbuka
Pantry							Terbuka
R.Persiapan							Tertutup
Washing Area							Tertutup
Storage							Tertutup
Dapur							Tertutup
ATM centre							
Ruang ATM							Tertutup
FASILITAS PENGELOLA							
Kantor pengelola							
Lobby							Terbuka
Ruang tunggu							Terbuka
R. Kepala pengelola							Tertutup
R. Sekretaris							Tertutup
R. rapat							Tertutup
R. Kabag pendidikan							Tertutup
R. Pemeliharaan satwa							Tertutup
R. staff							Tertutup
Toilet							Tertutup

FASILITAS SERVICE							
R. uilitas							
Parkir							Terbuka
Ruang keamanan							Terbuka
Gudang							Tertutup
R. istirahat karyawan							Terbuka
Ruang ME							Tertutup
Ruang plumbing							Tertutup
Ruang P3K							Terbuka
R. Karantina							Tertutup
Toilet							Tertutup

(Source: Analysis results, 2011)

Keterangan:

Need

No Need

4.3.5 The Size Space Analysis

Table 4.5: The Size Space Analysis

Kelp. Ruang	Keb. Ruang	Kapasitas (m2/orang)	Standar (m2)	Luasan (m2)
Hall penerima	**Tiketing Area**			
	Ticketing area	8 orang	4	32
	Total			32
	Penerima Tamu			
	Lobby	150 orang	0.9	135

	Tourism information centre	1 unit	9	9
	Security post	1 unit	5	5
	Total			149
Fasilitas Utama	**Kandang Mammalia**			
	Tapir			
	Kandang luar			642
	Kandang dalam	4 ekor	4	16
	Total			658
	Chetaah			
	Kandang luar			554
	Kandang dalam	2 ekor	5	10
	Total			564
	Kera Besar			
	Kandang luar			846
	Total			846
	Onta			
	Kandang luar			272.8
	Kandang dalam	4 ekor	7	28
	Total			300.8
	Zebra			
	Kandang luar			360
	Kandang dalam	4 ekor	4	16
	Total			376
	Nilgey dan Rusa sambar			
	Kandang luar			832
	Kandang dalam	4 ekor	3	12
	Total			846
	Capybara			
	Kandang luar			526.4

	Total			526.4
	Beruang dan kucing besar			
	Kandang luar			
	Kandang dalam			
	Total			1184.4
	Primata			
	Kandang luar			3055
	Total			3055
	Jerapah			
	Kandang luar			
	Kandang dalam	4 ekor	8	32
	Total			564
	Llama			
	Kandang luar			526.4
	Total			526.4
	Bison dan Banteng			
	Kandang luar			642
	Kandang dalam	4 ekor	4	16
	Total			658
	Rusa Bawean, Kijang, rusa Tutul, Rusa Arjuna			
	Kandang luar			1668
	Kandang dalam	8 ekor	3	24
	Total			1692
	Gajah			
	Kandang luar			1652
	Kandang dalam	4 ekor	10	40
	Total			1692

	Rusa Sambar, Sitatunga, Kanguru, Kulan			
	Kandang luar			1254.4
	Kandang dalam	8 ekor	3	24
	Total			1278.4
	Rusa Timorensis			
	Kandang luar			740
	Kandang dalam	4 ekor	3	12
	Total			752
	Anoa dan Babi Rusa			
	Kandang luar			1341.6
	Kandang dalam	4 ekor	3	12
	Total			1353.6
	Kuda Nil			
	Kandang luar			
	Kandang dalam			
	Total			846
	Harimau Sumatra			
	Kandang luar			967.6
	Kandang dalam	2 ekor	5	10
	Total			977.6
	Bekantan			
	Kandang luar			1692
	Total			1692
	Harimau Putih			
	Kandang luar			554
	Kandang dalam	2 ekor	5	10
	Total			564

	Singa			
	Kandang luar			
	Kandang dalam	2 ekor	5	10
	Total			564
	Kambing Gunung			
	Kandang luar			1576.6
	Kandang dalam	4 ekor	3	12
	Total			1588.6
	Owa			
	Kandang luar			
	Kandang dalam			
	Total			197.4
	Berang-berang			
	Kandang luar			394.8
	Total			394.8
	Elang jawa			
	Kandang luar			282
	Total			282
	Kuda			
	Kandang luar			502.4
	Kandang dalam	4 ekor	6	24
	Total			526.4
	Chimpanze dan Oran Utan			
	Kandang luar			883.6
	Total			883.6
	Total			25916
	Kandang Aves			
	Merak Mambruk			1306.6
	Burung air			2039.8

	Julang			376
	Kakaktua			376
	Jalak Bali			1654.4
	Burung Pemangsa			300.8
	Ostrich			488.8
	Total			6543
	Kandang Reptile			
	Ular			827.2
	Komodo			2052
	Buaya			846
	Total			2801
	Aquarium pisces			
	Aquarium			940
	Total			940
Fasilitas Pendukung	**Café/ restoran**			
	Area makan	52 orang	1.5	78
	Bar	5 orang	1.1	5.5
	R. Persiapan	1 unit	12.8	12.8
	Dapur	1 unit	42	42
	Pantry	1 unit	12.8	12.8
	Washing area	1 unit	15	15
	Storage	1 unit	13	13
	Toilet	2 unit	2.5	5
	Total			184.1
	Perpustakaan			
	Lobby	10 orang	0.9	9
	Ruang baca	50 orang	1.5	75
	Ruang koleksi	1 unit1		100

	Toilet	2 unit	2.5	5
	Total			189
	Klinik Hewan			
	Lobby	5 orang	0.9	4.5
	Ruang perawatan	I unit	8x10	80
	Ruang obat	1 unit	3x3	9
	Laboratorium	1 unit	6x5	30
	Pantry	1 unit	12.8	12.8
	Total			136.3
	Diorama			
	Lobby	30 orang	0.9	27
	Ruang pameran	10 unit	6	60
	Storage	1 unit	13	13
	Total			99
	Masjid/musholla			
	Tempat wudhu	10 orang	0.9	9
	Ruang sholat	150 orang	0.9	135
	Teras	100 orang	0.4	40
	Toilet	6 unit	3	18
	Gudang peralatan	1 unit	9	9
	Total			211
	Souvenir Shop			
	Kasir	2 orang	4	8
	Ruang display	1 unit	20	20
	Total			28
	Coffee Shop			
	Area makan	8 orang	1.5	12
	R.Persiapan	1 unit	4	4
	Dapur	1 unit	9	9
	Pantry	1 unit	4	4

	Washing Area	1 unit	2	2
	Storage	1 unit	4	4
	Total			35
	ATM centre			
	Ruang ATM	5 unit	4	20
	Total			20
Fasilitas Pengelola	**Kantor pengelola**			
	Lobby	10 orang	0.9	9
	Ruang tunggu	1 unit	12	12
	R. Kepala pengelola	1 unit	16	16
	R. Sekretaris	1 unit	12	12
	R. rapat	50	2.4	70
	R. Kabag pendidikan	1 unit	12	12
	R. Pemeliharaan satwa	1 unit	12	12
	R. staff	30	5	80
	Toilet	6 unit	3	18
	Total			241
Fasilitas service	**R. utilitas**			
	Parkir			
	Parkir mobil	350 unit	2.5x5	4375
	Parkir bus	10 unit	4x12	480
	Parkir truk	3 unit	3.5x11	115.5
	Parkir motor	400 unit	2x1	800
	Ruang keamanan	1 unit	5	5
	Gudang	1 unit	50	50
	R. istirahat karyawan	1 unit	40	40
	Total			5865.5
	Ruang ME			
	CCTV	3 unit	20	60

	R. Genset	1 unit	80	80
	R. operator Elektrikal & Sound Sistem	1 unit	28	28
	R.Panel Listrik	3 unit	20	60
	R.Pompa	1 unit	20	20
	R. Karantina	1 unit	30x15	450
	Toilet	4 unit	3	12
	Total			710

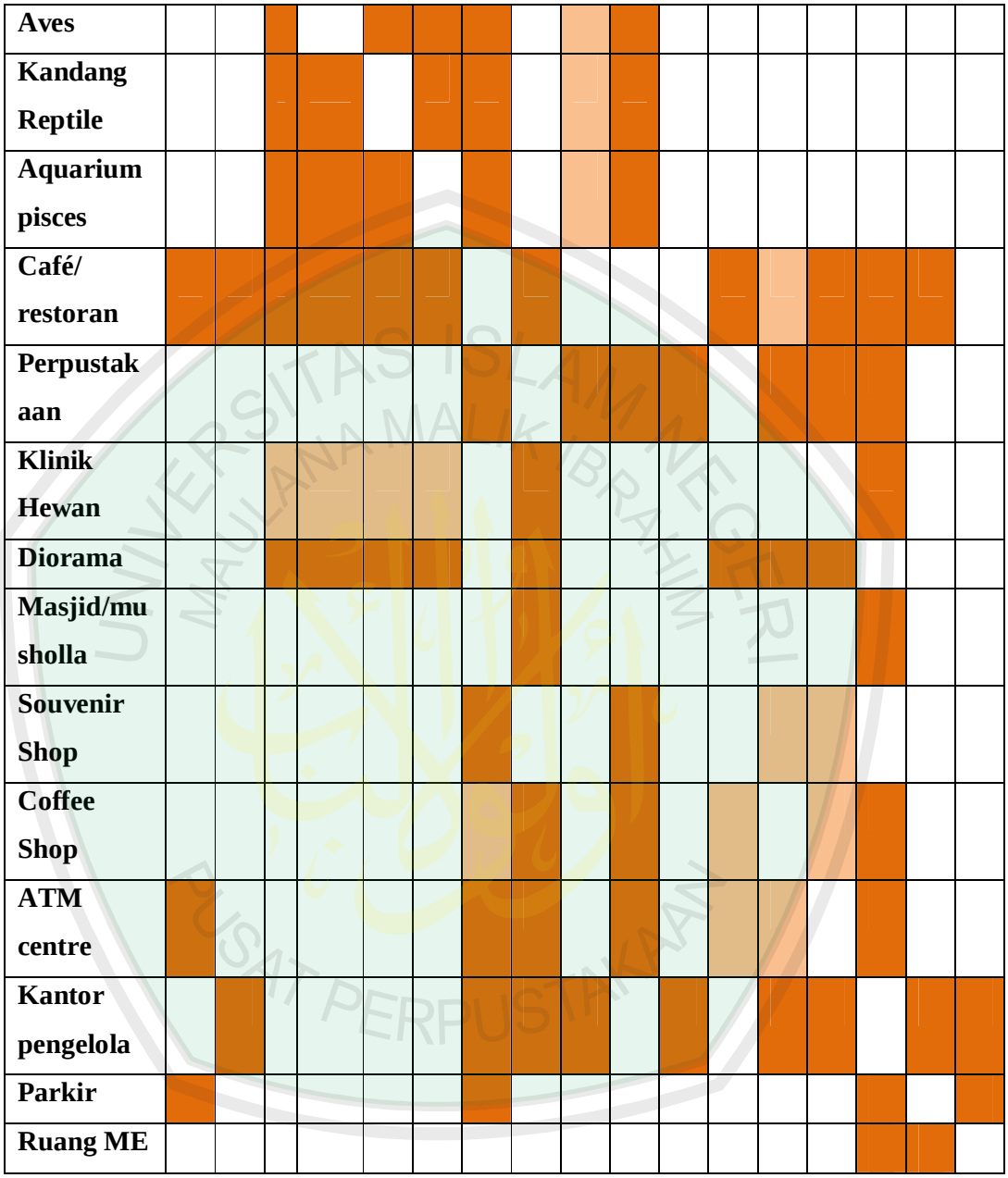
(Source: Analysis results, 2010)

4.3.6 Analysis of Connecting Space

Analysis of connection between space conducted aiming to determine the closeness between the existing spaces. On the relationship between space there are three connection namely direct, indirect, and no connection. Determination of connection between space influenced by the character of the activities and functions.

Table 4.6: Analysis of Connecting Space

Ruang	Tiketing Area	Penerima	Kandang	Kandang Aves	Kandang	Aquarium	Café/ restoran	Perpustakaan	Klinik Hewan	Diorama	Masjid/musholl	Souvenir Shop	Coffee Shop	ATM centre	Kantor	Parkir	Ruang ME
Tiketing Area																	
Penerima Tamu																	
Kandang Mammalia																	
Kandang																	



(Source: Analysis results, 2011)

Keterangan:

Direct Indirect No Connection

4.4 Analysis of Mass Buildings

4.4.1 Analysis of the Shape

The building mass tend to demonstrate the efficiency in accordance with the demand function of the building itself. Form of the building mass should be considered against:

- Activities in the building
- Space Efficiency
- Adjustments to the shape of tread
- Climatic conditions

Appearance of the building attempted to appear as attractive as possible in order to attract people to come. Hence the appearance of buildings should consider the following:

- For commercial buildings with the function of the leisure park buildings should reflect the activities within it are comfortable, and recreational
- Buildings should not be too high

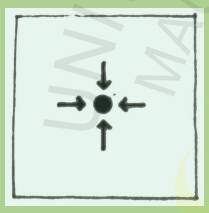
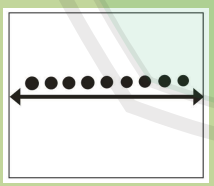
Building mass forms that can be used, namely;

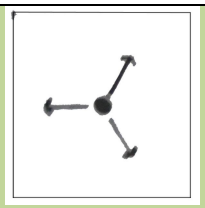
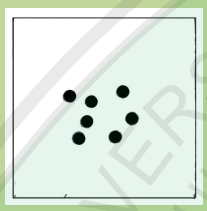
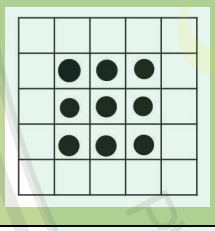
- The square is the form most commonly used in the mass of the building because of its ease in modification and development into new forms that are very diverse
- Form a circle and give the impression of gently curved, solid, and software. This form is suitable for group activities. Applied in one piece, a half circle, or the segments that are smaller and easily combined with other forms

- The triangular shape, this shape reflects the stability, but it is difficult in the setting

4.4.2 Building Mass Pattern Analysis

Table 4.7: The Pattern of Mass of the Building and Character

Pola Massa Bangunan	Sifatnya
Pola Memusat (*Centralized form*) 	• Bersifat stabil dan tertutup • Ruang di tengah berfungsi sebagai pemersatu • Pada umumnya berbentuk teratur • System surkulasi jelas (berpola radial, loop, atau spiral) • Adanya keterkaitan pad pola massa bangunan • Pengembangan dengan sebuah titik pusat yang kuat/dominan
Pola Linier (*Linier form*) 	• Terdiri dari ruang-ruang yang berulang • Bersifat fleksibel • Tanggap terhadap bermacammacam bentuk tapak, bisa berbentuk lurus, bersegmen atau melengkung • Memberikan kesan mengarah dan teratur • Memperlihatkan kegiatan yang berurutan, tidak ada kegiatan yang utama • Pengembangan dengan sebuah garis maya • Merupakan kumpulan massa dengan massa di tengah sebagai pengikat.
Pola Radial (*Radial Form*)	• Pengembangan komposisi linier dengan memusat

	
Pola Cluster (*Cluster form*) 	• Bersifat fleksibel karena dapat menghasilkan ruang terbuka yang menyatu • Dinamis karena polanya yang bervariasi • Pengembangan bebas
Pola Grid *(Grid form)* 	• Bersifat stabil • Berbentuk teratur • Meiliki besaran dimensi yang sama • Bentuk geometri yang berulang

(Source: D. K. Ching, 2011)

4.4.3 Analysis of the Display

View at building a self-identity of the building itself that shows the intent of the design are made. As is to be achieved at the Surabaya Zoo, among others:

a. The building shows his identity as the zoo buildings that are easily recognizable
b. The building is part of the environment, the existence of unity in the surrounding environment does not harm the environment

c. The building design is directed according to the theme of green architecture by using the existing aspects of the theme.

4.5. Analysis of Drainage

Planning area drainage system currently implemented is an open drainage system, an artificial drainage system. Based on the identification and field observations, problems of drainage area plans currently are as follows:

- The existing drainage system in this region have not shown an integrated system
- Lack of care so that not a pretty sight to visitors
- The open drainage system, its location is easily accessible by visitors, so it is not appealing to the eye.

The analysis can be done:

- Using a closed system but there is a control area as a place
- System of drainage is directed through the parts that are not easily seen by visitors, such as service areas.
- Direction is directed to a drainage culvert in one direction.
- Direction of river drainage directed to the site located near the location.

4.6. Analysis of Utility

Utility analysis is the analysis conducted in order to know the system is inside the building to support the achievement of the elements of comfort, health, safety, ease of communication and mobility in buildings. The things to consider is the air system, water system, sewage system, transportation system.

4.6.1 Air System Analysis

In the discussion of the air system at the Surabaya Zoo is closely related to the air system with air planning system to achieve the comfort, health, and freshness of living in the building. How to get the fresh air of nature, among others:

a. Provide openings in areas in need of fresh air
b. Given the nature of cross-ventilation
c. Air to the cages using the natural air, vegetation inside the air filter becomes dirty from the outside air is fresher and better for animals.

On certain spaces of processes, materials, equipment or goods in it requires a certain air refresher will be given a air system using the air conditioner.

But at the Surabaya Zoo preferably obtained using the natural air with lots of openings, as well as the existence of a lot of vegetation on site support system uses the natural air.

4.6.2 Water System Analysis

Need for water for rooms such as bathrooms, toilets, pantry, mosque, café. Clean water at the Surabaya Zoo was designed to use tap water and water Deep Well / pump in the well.

Table 4.8: Analysis of water system

Type	Advantages	Disadvantages
Tank Top	Energy-efficient, just need to pump when the tank is empty. When the	If the valve is open the other valve the pressure

	power was off the faucet still able to function because there is still a supply of water in the tank top.	is reduced.
Tank Bottom	Without the upper room, the pressure the same as using a pump	When a power failure can not drain water, electricity usage is quite wasteful since the beginning of a great power is turned on using

(Source: Analysis results, 2011)

Water sources were also obtained from the rain, with less make a tank to collect rain water which can then be used for watering the plants in it, so more water and energy saving.

4.6.3 Wastewater Disposal System Analysis

Wastewater/sewage is used water is disposed of. Wastewater can be divided into sections according to their use with less results.

a. Former waste water: water used for washing, bathing, and a variety of other uses.
b. Wastewater: water to clean the waste / debris.
c. Rain water: water that falls onto the surface of land or buildings.

d. Special waste water: water used washing of impurities and specific tools such as used water from hospitals, laboratories, restaurants and factories.

System to be used is to use a separate Shaff for easy handling. First passing dirty water then flowed into the trap of plumbing pipe, and then piped into the bed of control and then piped into the septic tank and into recharge.